

REMARKS

Claims 1-14 are pending. By this Amendment, claim 1 is amended to specify the features of claim 2, claim 2 is cancelled, and the dependency of claim 3 is adjusted to depend on claim 1 (now specifying the subject matter of prior claim 2), and dependent claims 9-14 are added. Claims 9-11 depend from claim 1, and claims 12-14 depend from claim 4.

Dependent claims 9-14 have been added to specify a further embodiment of the invention that has a feature where the gate dielectric is deposited as early as possible and then left in tact afterwards at least in the photosensitive area of the device. The prior art techniques deposit (one or more times) one or more dielectric layers (e.g. of oxide) and remove them subsequently by etching. The features of claims 9-14 have distinct advantages over the prior art. For example, a large dark current and white spots - which are unacceptable in the photosensitive area - are avoided.

It is respectfully submitted that dependent claims 7 and 8 were added in the Amendment filed October 14, 2003; however, the Office Action does not appear to have examined these claims. The Patent Office is earnestly solicited to clarify whether these claims have been examined.

The Office Action rejects claims 1-6 under 35 U.S.C. §103(a) as being unpatentable over the combination of U.S. Patent No. 3,699,646 to Vadasz and U.S. Patent No. 5,702,971 to Stevens. If applicable to the present claims, this rejection is respectfully traversed.

A. Stevens does not disclose, teach or suggest a method in which a silicon slice is provided with "a gate dielectric comprising a layer of silicon oxide and a silicon nitride layer deposited thereon" and "the silicon nitride layer is formed by low pressure chemical vapor deposition" as specified in current claim 1 (i.e., prior claim 2). Similarly, Vadasz does disclose this feature as well. Accordingly, claim 1 cannot be rendered obvious by the combination of Vadasz and Stevens.

B. Furthermore, Stevens does not disclose, teach or suggest a method in which a silicon slice is provided with “channel-shaped semiconductor regions running in a first direction” and in which “a system of strip-shaped electrodes is formed on the gate dielectric, said strip-shaped electrodes running in a second direction which is substantially perpendicular to the first direction” as specified in current and prior claim 1. In fact, since the implant forming buried channel region 35 is disclosed by Stevens as being formed by an antiblooming implant, it is likely (i.e., the disclosure of Stevens suggests) that the electrode 37 runs in a direction parallel to, not substantially perpendicular to, the direction buried channel region 35 since Stevens discloses this structure as providing the antiblooming function. In any event, the Office Action cites no evidence that the electrode 37 runs in a direction substantially perpendicular to the direction buried channel region 35 as would be required to read on current and prior claim 1. Vadasz does disclose this feature as well. Accordingly, claim 1, and all claims dependent on claim 1, are not rendered obvious by the combination of Vadasz and Stevens.

Similarly, Stevens does not disclose, teach or suggest a method that includes “forming a plurality of elongate channels in the silicon slice by implanting dopant ions through the gate dielectric into the silicon slice” and “forming a system of elongate gate electrodes on the gate dielectric after the channels are formed, the elongate electrodes being formed transversely to the channels” as specified in claim 4, and therefore contained in all claims dependent on claim 4. Vadasz does disclose this feature as well. Accordingly, claim 4, and all claims dependent thereon, cannot be rendered obvious by the combination of Vadasz and Stevens.

C. Additionally, Stevens is non-analogous art to Vadasz and is not combinable therewith. To be analogous art, the two references must either be within the same technical field of endeavor or address the same technical problem. Stevens is in the technical field of antiblooming structures for CCD image sensors (see column 1, lines 4-6), but Vadasz is in the technical field of semiconductor integrated circuits (see column 1, lines 5-15), different technical

fields. Stevens addresses the technical problem of forming a lateral-overflow drain antiblooming structure that is insensitive to drain bias (see column 2, line 67), but Vadasz addresses the technical problem of higher density and better yields in the making of semiconductor integrated circuits (see column 2, lines 20-24), different technical problems. The two references are non-analogous and not properly combinable.

D. Furthermore, the Office Action fails to establish a *prima facie* case of obviousness. The Office Action asserts as motivation to combine the references “because one of ordinary skill in the art would have been motivated to look to analogous art teaching suitable or useful methods of performing the disclosed gate dielectric formation step of Stevens.” However, the Office Action fails to establish or proffer *prima facie* evidence of such motivation. Stevens does not disclose any reason or motivation why one would want “to look to analogous art teaching suitable or useful methods of performing the disclosed gate dielectric formation” (in the words of the Office Action). Vadasz also provides no motivation to modify structures of Stevens according to dielectrics of Vadasz.

The Office Action bases its reasoning, as to motivation to combine, on “art recognized suitability for an intended purpose has been recognized to be motivation to combine. MPEP 2144.07.” This assertion, as a basis for motivation to combine, is respectfully traversed. Here, the MPEP is addressing a situation where a particular material is known (from whatever source) for its suitability for a particular intended use. The predicate for this line of reasoning for a *prima facie* obviousness rejection is that the material is known for that intended use. Vadasz discloses the gate dielectric is suitable for use in a silicon gate device (SGD). In contrast, the structure of Stevens is different. In Stevens, gate dielectric 14 is disposed between channel 35 and electrode 37 of an antiblooming structure in a CCD image sensor. The Office Action proffers no evidence that a gate dielectric known to be suitable for silicon gate devices would be suitable for antiblooming structures for CCD image sensors as described in Stevens.

To establish a case of obviousness, the Patent and Trademark Office must demonstrate by substantial evidence that the prior art relied upon, coupled with the knowledge generally

available in the art at the time of the invention, contains some suggestion or incentive that would have motivated an ordinarily skilled person to modify the subject matter of a reference or combine the subject matters of the references to achieve the claimed subject matter. *In re Fine*, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). M.P.E.P. 2143.01 instructs that “Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art.” “[T]he central question is whether there is reason to combine references,” *McGinley v. Franklin Sports, Inc.*, 262 F.3d 1339, 1351-52, 60 USPQ2d 1001, 1008 (Fed. Cir. 2001). “The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *In re Mills*, 916 F.2d 680, 16 USPQ2d 1430 (Fed. Cir. 1990).” See M.P.E.P., section 2143.01, page 2100-98, Rev. 1, Feb. 2000, 7th Ed (emphasis in the original).

“[A] showing of a suggestion, teaching, or motivation to combine the prior art references is an ‘essential component of an obviousness holding’,” *Brown and Williamson Tobacco Corp. v. Phillip Morris Inc.*, 229 F.3d 1120, 1124-1125, 56 USPQ2d 1456, 1459 (Fed. Cir. 2000). “[T]here must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant,” *In re Dance*, 160 F.3d 1339, 1343, 48 USPQ2d 1635, 1637 (Fed. Cir. 1998). “[T]eachings of references can be combined only if there is some suggestion or incentive to do so,” (emphasis in original), *In re Fine*, 837 F.2d 1071, 1075, 5 USPQ2d 1596, 1600 (Fed. Cir. 1988).

Motivation must be found with specificity. “[P]articular findings must be made as to the reason the skilled artisan, with no knowledge of the claimed invention would have selected these components for combination in the manner claimed,” *In re Kotzab*, 217 F.3d 1365, 1371, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). “[E]ven when the level of skill in the art is high, the Board must identify specifically the principle, known to one of ordinary skill, that suggests the claimed combination. In other words, the Board must explain the reasons one of ordinary skill in the art would have been motivated to select the references and to combine them to render the

claimed invention obvious,” *In re Rouffet*, 149 F.3d 1350, 1359, 47 USPQ2d 1453, 1459 (Fed. Cir. 1998). The Patent Office can satisfy this burden of showing the obviousness of the combination “only by showing some objective teaching in the prior art or that knowledge generally available to one of ordinary skill in the art would lead that individual to combine the relevant teachings of the references,” *In re Fitch*, 972 F.2d 1260, 1265, 23 USPQ2d 1780, 1783 (Fed. Cir. 1992).

Establishment of a suggestion or incentive to modify or combine prior art references requires substantial evidence of such suggestion or incentive. “The factual question of motivation is material to patentability, and could not be resolved on subjective belief of unknown authority,” *In re Lee*, 61 USPQ2d 1430 (Fed. Cir. 2002). Office Action assertions of such suggestion or motivation, without evidentiary support, is merely subjective belief and is insufficient to constitute substantial evidence upon which a legal conclusion can be based.

In re Lee describes a two fold requirement for the Board of Patent Appeals and Interferences to establish a motivation to modify. First, the Board must make reasoned findings of fact, based on evidence on record. Second, the Board must also explain the reasoning by which the findings are deemed to support the Board’s conclusion. It should be noted that these are requirements imposed on decisions of the Board, not decisions of the examiner corps. However, the examiner corps must still make the record (e.g., applied art teaches ...) upon which the factual findings of motivation can be based.

CONCLUSION

In view of the present amendments and remarks, withdrawal of the rejection of the claims is earnestly solicited. It is respectfully submitted that the present application is in condition for allowance. Prompt reconsideration and allowance of the application are earnestly solicited. Should the examiner believe that any further action is necessary to place the application in condition for allowance, the examiner is invited to contact the undersigned applicant representative at the telephone number listed below.

Appl. No. 09/888,463
Amdt. dated February 27, 2004
Reply to Office Action of January 9, 2004

The Commissioner is hereby authorized to charge any fees (or credit any overpayment) associated with this communication to Deposit Account No. 04-1425.

Respectfully submitted,

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